NRCS Natural Resources Conservation Service

Utah Water Supply Outlook Report

April 1, 2004

Photos of Johnson Valley and Lake Fork 3 snow courses. Left side - March 1 Survey, Photos on the right April 1, Survey - record snowpack losses for March.
Photos by Ray Wilson and Randy Julander, Snow survey, NRCS, USDA

Water Supply Outlook Reports
and
Federal - State - Private
Cooperative Snow Surveys

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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snowcourses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

STATE OF UTAH GENERAL OUTLOOK
Apr 1, 2004

SUMMARY

Records are made to be broken. March 2004 is one we never want to see again! Recall at the beginning of the month, snowpacks were near average and we were pretty relaxed thinking that even if the worst observed March were to occur, we would still be in reasonable shape. What was the possibility that March 2004 would be worse than the worst? That is precisely what has happened - the worst March non-accumulation ever. Almost all watersheds in Utah have experienced a March where they have lost some snowpack but not like this! Every basin across the state except the Sevier had the worst March snowpack decrease ever, in some cases double and triple the worst ever and the Sevier had its second worst ever with 1972 being the only exception. Actual snowpack losses ranged from -2.4 on the Weber to -5.4 over southwest Utah. All this in what is normally one of the heaviest snowpack accumulation months of the year. Several sites in northern Utah are now at or near record lows for April 1 snowpack including Burts Miller Ranch (first recorded zero on April 1, started in 1937), Stillwater Camp, Blacks Fork Junction and Chalk Creek #3. Having lost a record 25% to 60% of March snowpack, streamflows barely rose in most locations and in fact, the Sevier River at Hatch (USGS data) has yet to come up to average flow conditions and average flows during March are typically pretty small to begin with! The reason for snowmelt not converting to streamflow is primarily due to the soil moisture deficit and snowpack losses to evapotranspiration and sublimation. Most streams have had only marginal responses to the record snowmelt. Snowpacks now range between 56% of average in southern Utah to 75% of average on the Provo/Jordan River watershed. Precipitation for March ranged from an abysmal 20 in southern Utah to a pathetic 45% on the Weber, bringing seasonal precipitation, (Oct-Mar) to 87%. Soil moisture remains a concern as there was very little precipitation accumulation prior to the onset of snowpacks. This condition is, in most watersheds about half the deficit of a month ago. Soil moisture deficits range from 2.5 to 6 inches in the upper 24 inches of soil. Low reservoir storage is also a concern with total reservoir storage at 45% of capacity, down 8% (428,000 Acre-Feet) from last year. 428,000 AF would be the entire reservoir capacity of the Sevier River Basin and then some. Areas of greatest concern are the Bear and Sevier River basins with current storage of 8% and 31% respectively. Streamflow forecasts range from 7% to 71% of average. Surface Water Supply Indexes range from 2% on the Bear River, Sevier and Moab areas to 45% over the western part of the Uintah Basin.

SNOWPACK

April first snowpacks as measured by the NRCS SNOTEL system range from 56% over southwestern and southeastern Utah to 75% on the Jordan River/Utah Lake Watersheds. Most areas are comparable to last year. The bright and optimistic side of the snowpack numbers is that we are not even close to the worst April 1 snowpack ever, with the exception of the upper Bear River Watershed.

PRECIPITATION

Mountain precipitation during March was much below average statewide (33%). In the north it was much below normal (45%) and in the south, only 25%. This brings the seasonal accumulation (Oct-Mar) to 87% of average statewide.

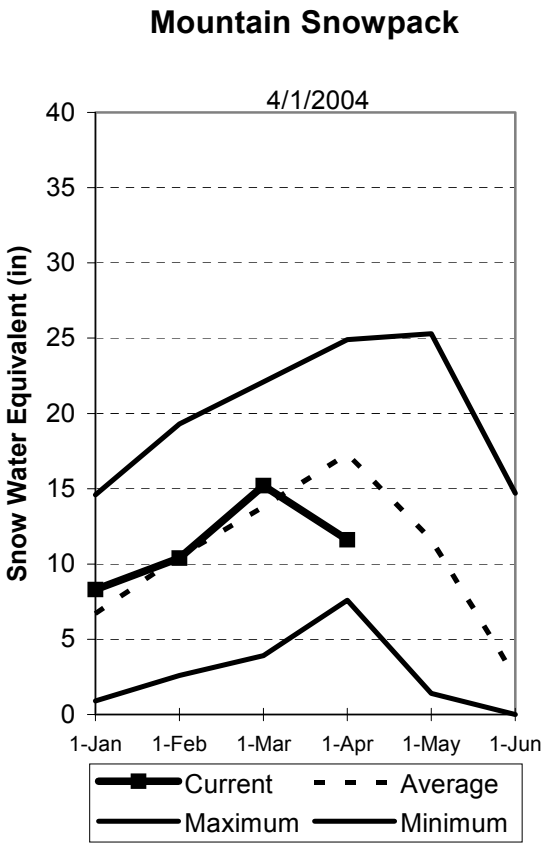
RESERVOIRS

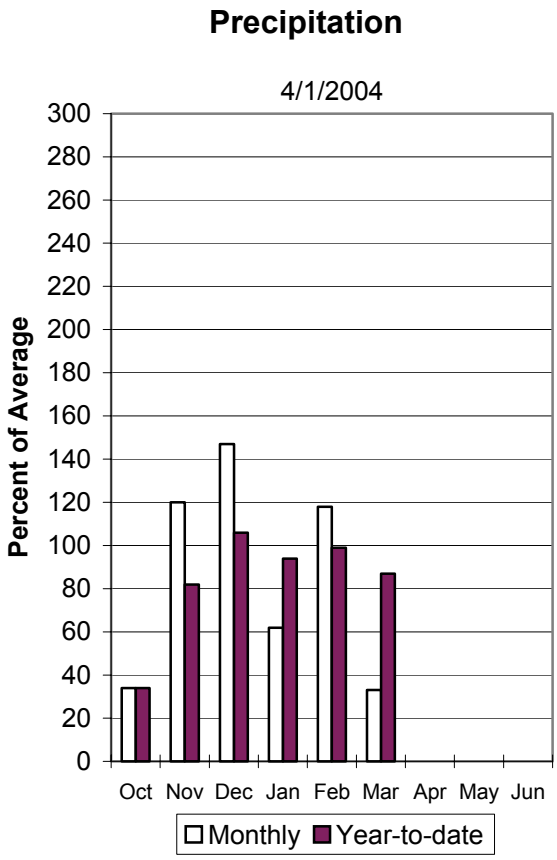
Storage in 41 of Utah's key irrigation reservoirs is at 45% of capacity, up only 4% from last month. This is down substantially (8%) from last year indicating heavy use of reservoir storage to make up

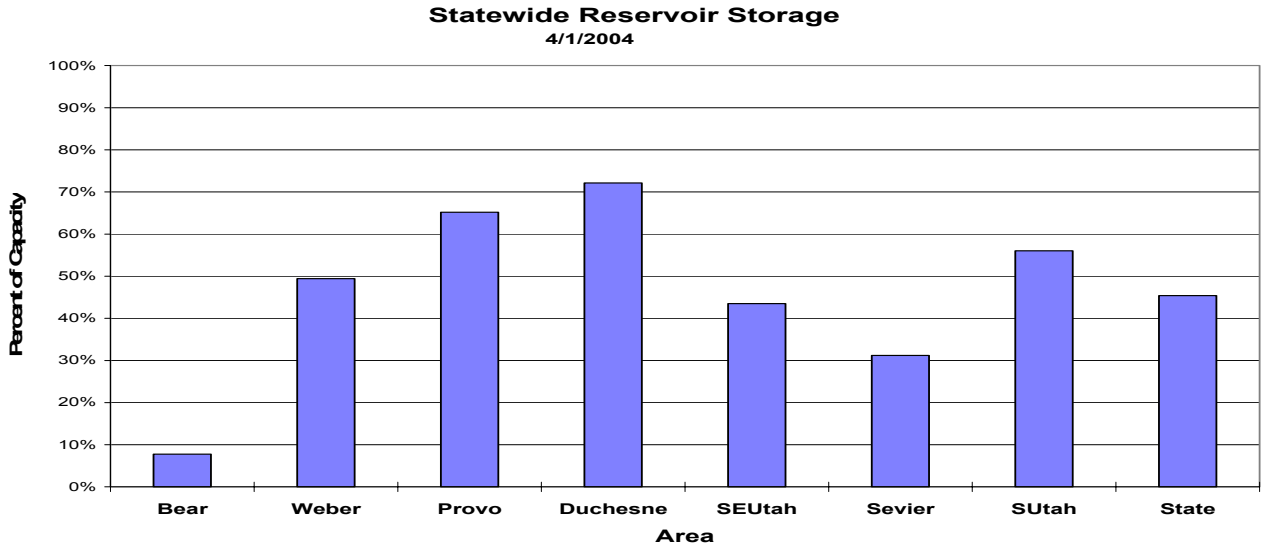
the streamflow deficit. Most reservoir operators are utilizing a conservative strategy, storing as much water as possible.

STREAMFLOW

Snowmelt streamflows are expected to be below to much below average across the entire state of Utah this year. Forecast streamflows range from 7% on the Bear at Stewart dam to 71% on Wheeler Creek, a stark contrast from forecasts issued last month. Most flows are forecast to be in the 30% to 60% range. Overall water supply conditions are below to much below normal.

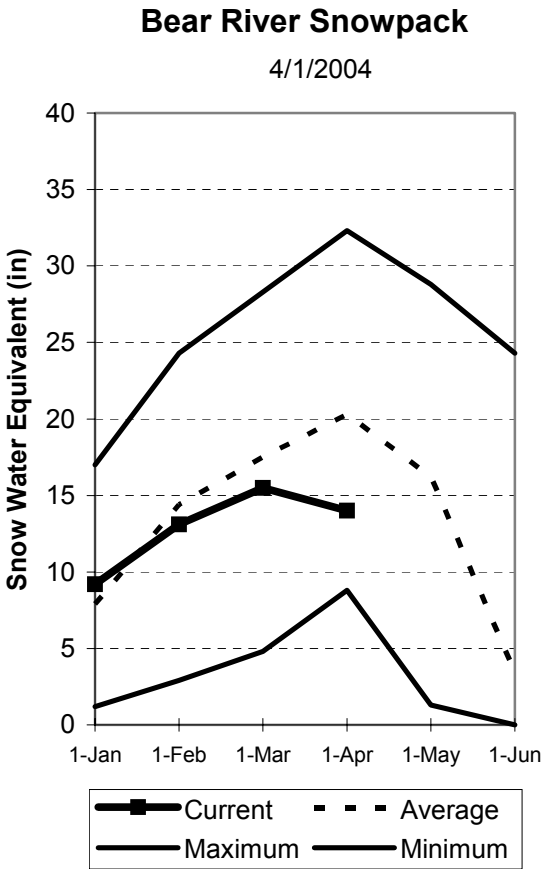


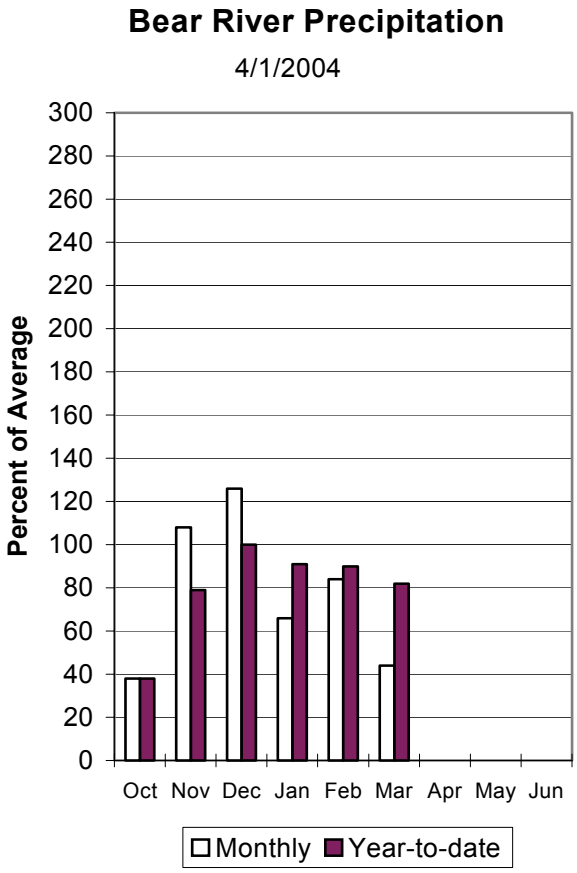


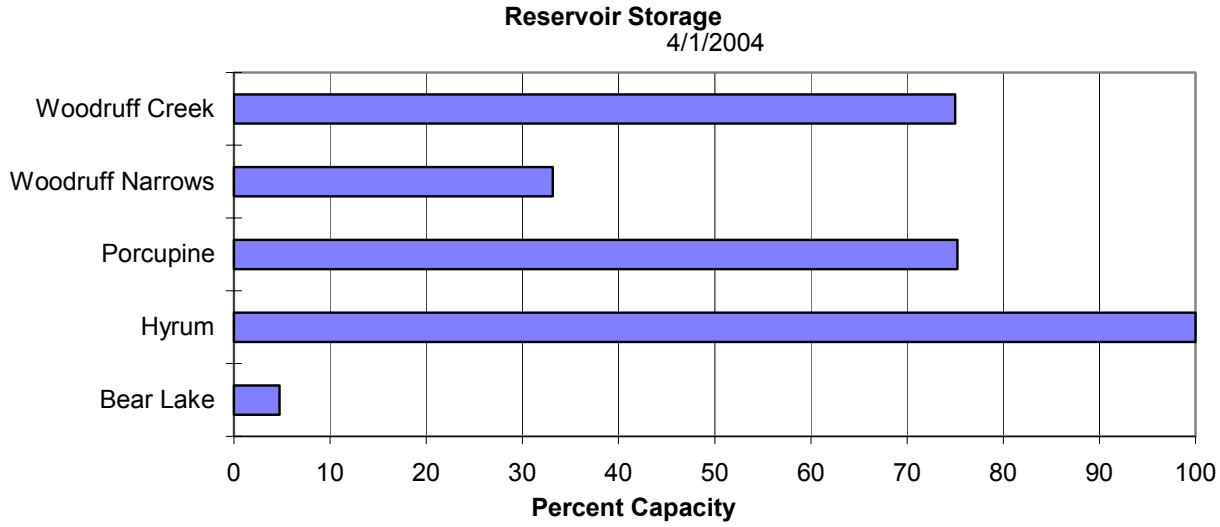


Bear River Basin
Apr 1, 2004

Snowpacks on the Bear River Basin are near average at 61% of normal, about 91% of last year and 30% less than last month. Specific sites range from 0% to 120% of normal. Low elevation snowpack is gone with a first ever zero reading at Burts Miller Ranch. March precipitation was much below average at 44%, which brings the seasonal accumulation (Oct-Mar) to 82% of average. Soil moisture levels in runoff producing areas indicate about 4.1 inches of deficit in the upper 2 feet of soil. Forecast streamflows are for much below normal (7%) to below normal volumes (57%) this spring. Reservoir storage is extremely low at 8% of capacity, 21% less than last year. The Surface Water Supply Index is at 2% for the Bear River, or 98% of years have had more total water available. Water supply conditions are much below normal.







BEAR RIVER BASIN
Streamflow Forecasts - April 1, 2004

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Bear River nr UT-WY State Line	APR-JUL	30	44	53	47	62	76	113
Bear River ab Reservoir nr Woodruff	APR-JUL	23	29	33	24	50	75	136
Big Creek nr Randolph	APR-JUL	0.38	0.48	0.55	11	1.18	2.10	4.90
Smiths Fork nr Border	APR-JUL	41	52	60	58	68	79	103
Bear River at Stewart Dam	APR-JUL	4.0	10.0	17.0	7	25	40	234
Little Bear River at Paradise	APR-JUL	13.9	19.0	23	50	27	34	46
Logan River nr Logan combined flow	APR-JUL	53	64	72	57	81	94	126
Blacksmith Fork nr Hyrum	APR-JUL	12.7	19.0	24	50	30	39	48

BEAR RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
BEAR LAKE	1302.0	61.7	389.1	---
HYRUM	15.3	15.3	15.3	12.2
PORCUPINE	11.3	8.5	7.9	6.7
WOODRUFF NARROWS	57.3	19.0	16.0	32.7
WOODRUFF CREEK	4.0	3.0	2.4	---

BEAR RIVER BASIN
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
BEAR RIVER, UPPER (abv Ha	6	90	62
BEAR RIVER, LOWER (blw Ha	8	90	60
LOGAN RIVER	4	87	62
RAFT RIVER	1	172	98
BEAR RIVER BASIN	14	90	61

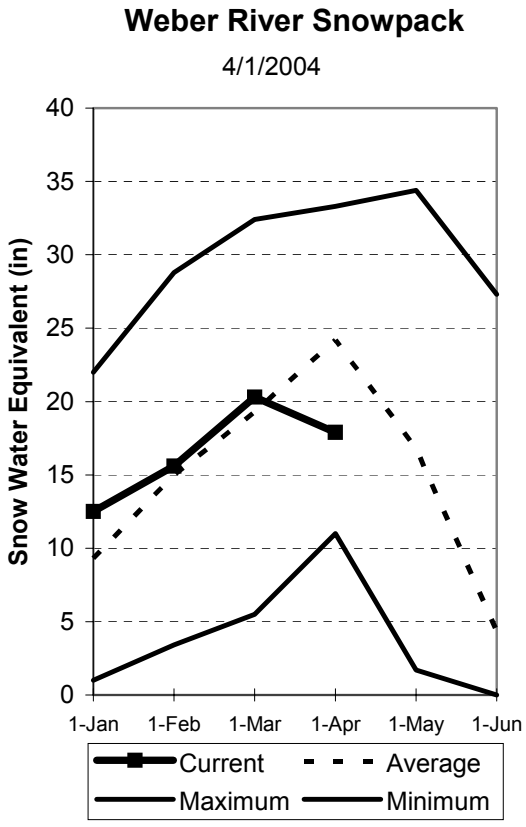
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

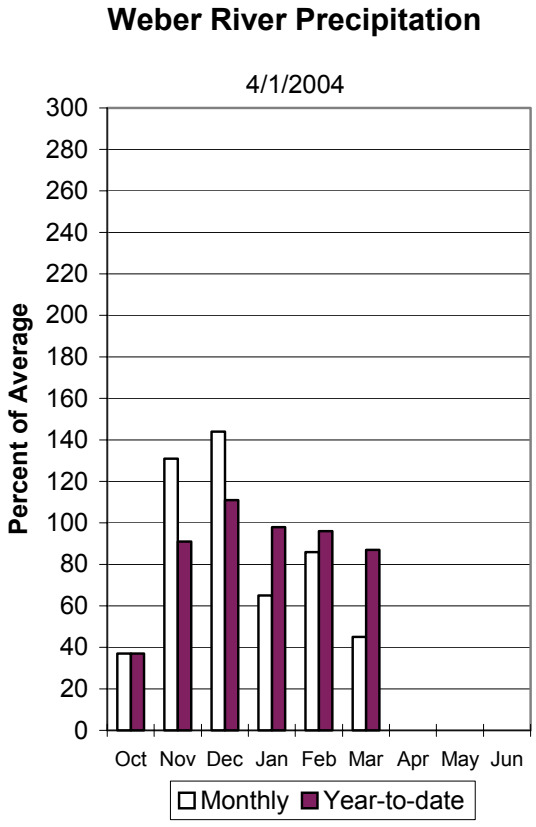
The average is computed for the 1971-2000 base period.

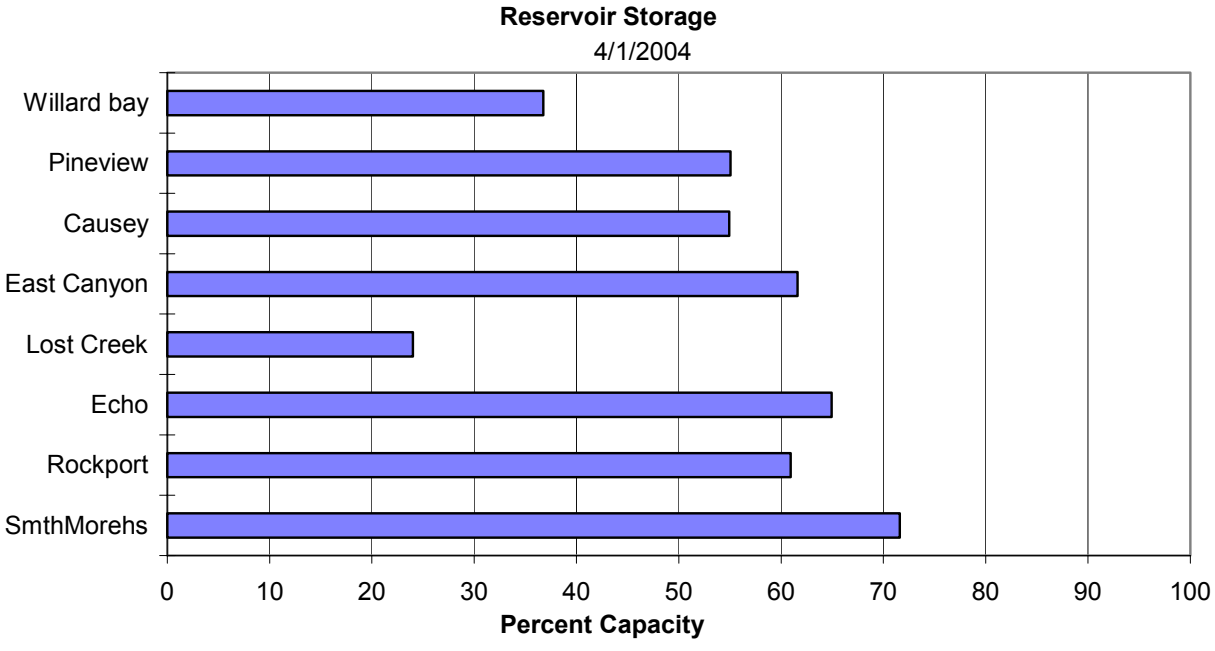
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Weber and Ogden River Basins
Apr 1, 2004

Snowpack on the Weber and Ogden Watersheds is below normal at 74% of average, about 125% of last year and down 28% relative to last month. Individual sites range from 0% to 119% of average. March precipitation was much below average at 45% bringing the seasonal accumulation (Oct-Mar) to 87% of average. Soil moisture levels in runoff producing areas indicate about 4.2 inches of deficit in the upper 2 feet of soil. Streamflow forecasts range from 31% to 71% of average. Reservoir storage is at 49% of capacity, about 6% less than last year. The Surface Water Supply Index is at 5% for the Weber River and at 23% for the Ogden River. Overall water supply conditions are much below normal due to low snowpack, reservoir storage and soil moisture conditions.







WEBER & OGDEN WATERSHEDS in Utah
Streamflow Forecasts - April 1, 2004

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Smith & Morehouse Res inflow	APR-JUL	10.3	14.6	17.5	52	20	25	34
Weber River nr Oakley	APR-JUL	32	47	58	47	69	84	123
Rockport Reservoir inflow	APR-JUL	19.0	39	52	39	65	85	134
Weber River nr Coalville	APR-JUL	15.0	36	50	37	64	85	137
Chalk Creek at Coalville	APR-JUL	9.3	12.1	14.0	31	21	32	45
Echo Reservoir inflow	APR-JUL	21	50	70	39	90	119	179
Lost Creek Reservoir inflow	APR-JUL	5.0	7.8	10.0	57	12.5	16.7	17.6
East Canyon Reservoir inflow	APR-JUL	10.5	14.2	17.0	55	20	25	31
Weber River at Gateway	APR-JUL	68	126	165	47	204	262	355
SF Ogden River nr Huntsville	APR-JUL	23	33	40	63	47	57	64
Pineview Reservoir inflow	APR-JUL	45	65	78	59	91	111	133
Wheeler Creek nr Huntsville	APR-JUL	2.50	3.70	4.50	71	5.30	6.50	6.30

WEBER & OGDEN WATERSHEDS in Utah
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
CAUSEY	7.1	3.9	2.5	2.6
EAST CANYON	49.5	30.5	33.0	36.5
ECHO	73.9	48.0	40.4	51.5
LOST CREEK	22.5	5.4	4.9	14.1
PINEVIEW	110.1	60.6	55.4	61.7
ROCKPORT	60.9	37.1	38.9	35.1
WILLARD BAY	215.0	79.0	118.5	160.9

WEBER & OGDEN WATERSHEDS in Utah
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
OGDEN RIVER	4	155	79
WEBER RIVER	9	115	71
WEBER & OGDEN WATERSHEDS	12	129	74

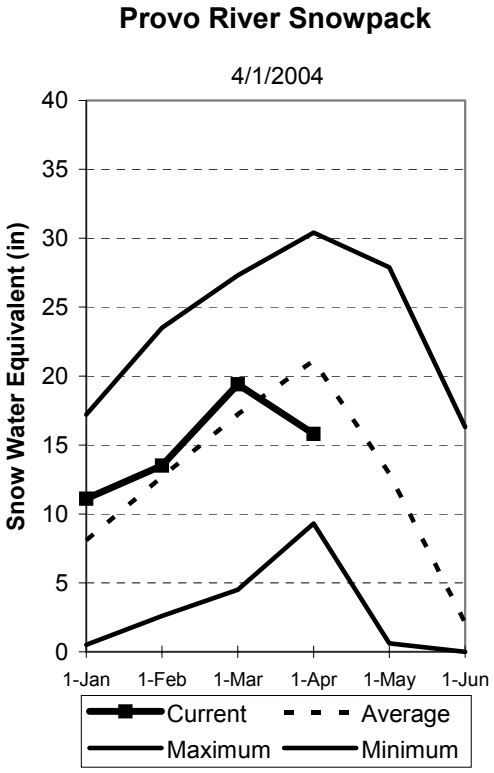
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

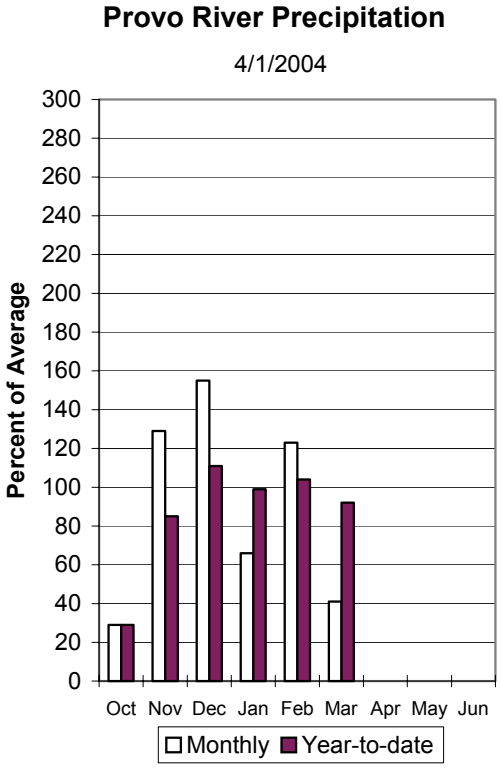
The average is computed for the 1971-2000 base period.

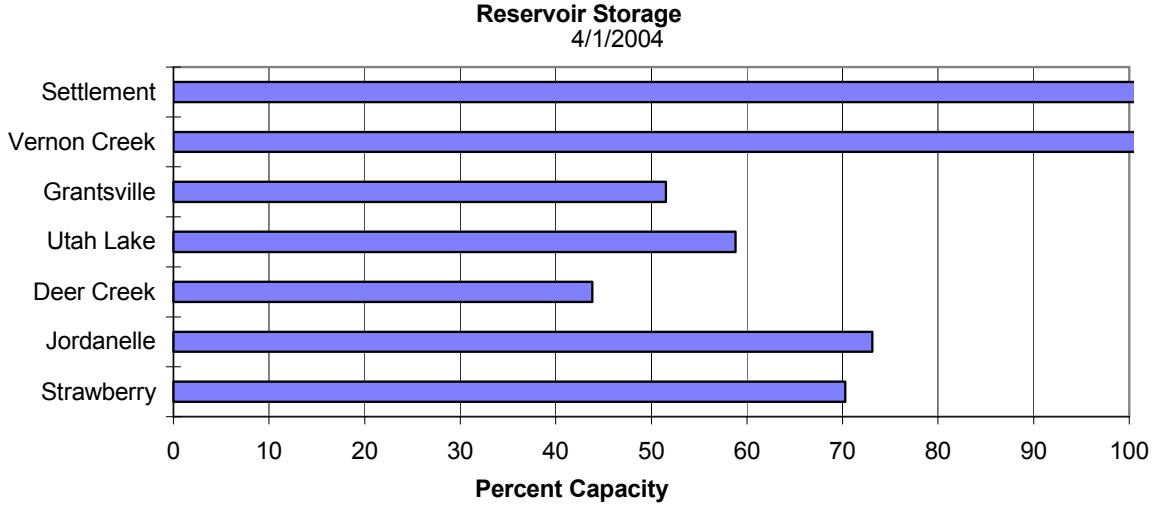
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Utah Lake, Jordan River & Tooele Valley Basins
Apr 1, 2004

Snowpacks over these watersheds are at 75% of average, 118% of last year and down 36% relative to last month. The upper Provo, the area of greatest water production, is at only 56% of average. Individual sites range from 4% to 119% of average. March precipitation was much below average at 41%, bringing the seasonal accumulation (Oct-Mar) to 92% of average. Soil moisture levels in runoff producing areas indicate about 2.7 inches of deficit in the upper 2 feet of soil. Forecast streamflows range from 35% to 85% of average. Reservoir storage is at 65% of capacity, 5% less than last year. The Surface Water Supply Index is at 9%, or 91% of years would have more total water available. General water supply conditions are below normal due to low snowpack, reservoir storage and soil moisture.







UTAH LAKE, JORDAN RIVER & TOOELE VALLEY
Streamflow Forecasts - April 1, 2004

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Spanish Fork River nr Castilla	APR-JUL	7.7	14.2	34	44	54	74	77
Provo River nr Woodland	APR-JUL	25	40	52	51	64	79	103
Provo River nr Hailstone	APR-JUL	15.0	37	51	47	65	87	109
Provo R blw Deer Creek Dam	APR-JUL	20	44	64	51	84	122	126
American Fk R nr American Fk	APR-JUL	12.2	16.2	19.0	59	22	26	32
Utah Lake inflow	APR-JUL	39	122	175	54	228	310	325
Little Cottonwood Ck nr SLC	APR-JUL	28	31	34	85	37	40	40
Big Cottonwood Ck nr SLC	APR-JUL	14.8	19.6	23	61	26	31	38
Mill Creek nr SLC	APR-JUL	3.40	4.93	6.00	86	7.07	8.60	7.00
Parley's Creek nr SLC	APR-JUL	3.3	7.4	10.5	63	13.6	17.5	16.7
Dell Fork nr SLC	APR-JUL	0.61	2.94	4.40	65	5.86	8.20	6.80
Emigration Creek nr SLC	APR-JUL	0.00	0.40	1.60	36	2.80	4.50	4.50
City Creek nr SLC	APR-JUL	0.96	1.62	3.00	35	4.38	6.40	8.70
Vernon Creek nr Vernon	APR-JUL	0.47	0.61	0.72	49	0.86	1.10	1.48
Settlement Creek nr Tooele	APR-JUL	0.49	0.72	0.91	46	1.13	1.53	1.97
South Willow Creek nr Grantsville	APR-JUL	0.95	1.60	2.10	65	2.60	3.20	3.23

UTAH LAKE, JORDAN RIVER & TOOELE VALLEY
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
DEER CREEK	149.7	62.6	89.2	113.0
GRANTSVILLE	3.3	1.7	1.8	2.7
SETTLEMENT CREEK	1.0	0.6	0.8	0.7
STRAWBERRY-ENLARGED	1105.9	777.4	812.6	648.8
UTAH LAKE	870.9	512.2	576.0	855.8
VERNON CREEK	0.6	0.7	0.6	---

UTAH LAKE, JORDAN RIVER & TOOELE VALLEY
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
PROVO RIVER & UTAH LAKE	7	96	57
PROVO RIVER	4	110	56
JORDAN RIVER & GREAT SALT	6	130	86
TOOELE VALLEY WATERSHEDS	3	151	88
UTAH LAKE, JORDAN RIVER &	16	120	75

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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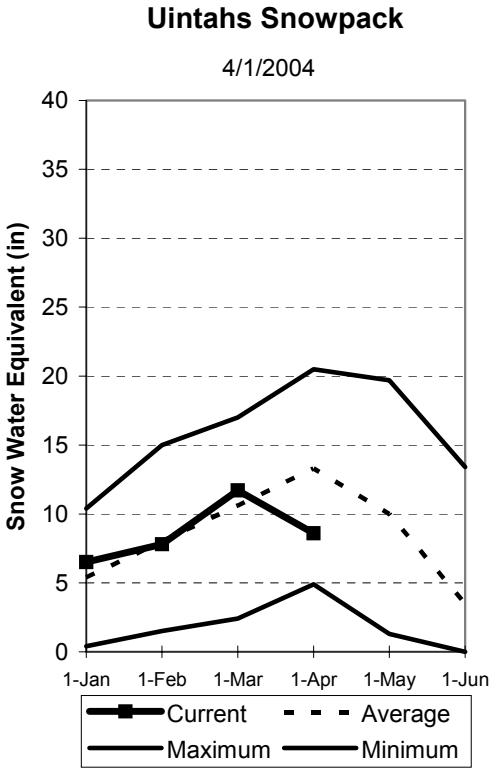
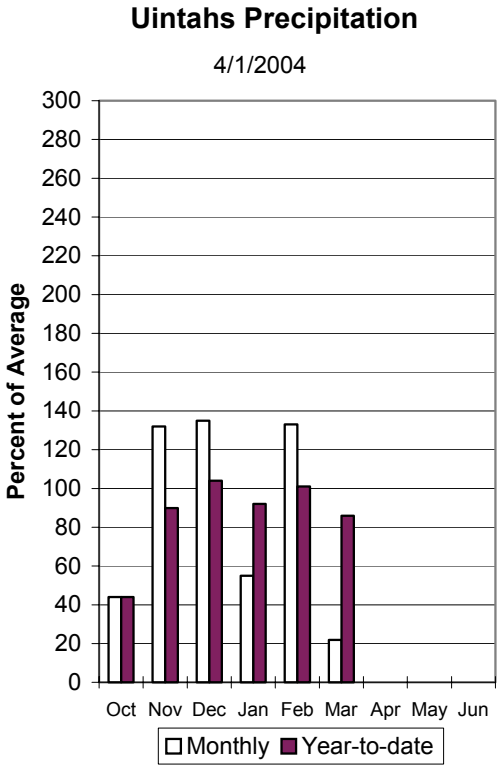
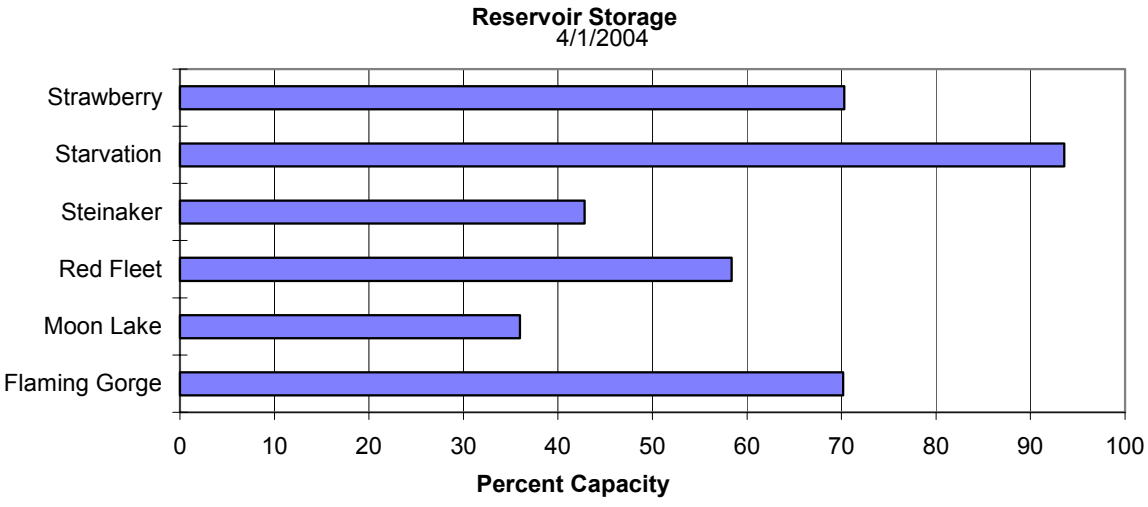
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Uintah Basin and Dagget SCD's
Apr 1, 2004

Snowpacks across the Uintah Basin and North Slope areas are much below average at 65%, which is 88% of last year, down 42% relative to last month. The North Slope ranges from 35% to 76% and the Uintah Basin ranges from 32% to 92% of average. Precipitation during March was much below average at 22% bringing the seasonal accumulation (Oct-Mar) to 86% of average. Soil moisture levels in runoff producing areas indicate about 4.6 inches of deficit in the upper 2 feet of soil. Reservoir storage is at 72% of capacity, 2% less than last year. The Surface Water Supply Index for the western area is 45% and for the eastern area it is 27% indicating normal on the west to poor conditions on the east. Streamflow forecasts range between 35% and 77% of average. Springtime runoff conditions are much below normal.







UINTAH BASIN & DAGGET SCD'S
Streamflow Forecasts - April 1, 2004

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Blacks Fork nr Robertson	APR-JUL	37	51	60	63	69	83	95
EF of Smiths Fork nr Robertson	APR-JUL	14.3	16.4	18.0	58	19.8	23	31
Flaming Gorge Reservoir Inflow	APR-JUL	320	500	620	52	740	920	1190
BIG BRUSH CK abv Red Fleet Resv	APR-JUL	7.6	11.6	14.3	68	17.0	21	21
Ashley Creek nr Vernal	APR-JUL	18.4	28	35	67	42	52	52
WF DUCHESNE RIVER nr Hanna	APR-JUL	6.1	9.3	11.8	49	14.6	19.4	24
DUCHESNE R nr Tabiona	APR-JUL	33	46	55	52	64	77	105
UPPER STILLWATER RESV inflow	APR-JUL	30	42	51	62	60	72	82
ROCK CK nr Mountain Home	APR-JUL	35	46	54	61	62	73	89
DUCHESNE R abv Knight Diversion	APR-JUL	48	79	100	53	121	152	188
STRAWBERRY RES nr Soldier Springs	APR-JUL	16.2	24	30	51	37	48	59
CURRANT CREEK RESV Inflow	APR-JUL	2.9	6.4	8.8	35	11.2	14.7	25
STARVATION RESERVOIR inflow	APR-JUL	23	46	61	50	76	99	121
Lake Fork River abv Moon Lake	APR-JUL	36	46	52	77	58	68	68
Yellowstone River nr Altonah	APR-JUL	27	38	46	74	54	65	62
DUCHESNE R at Myton	APR-JUL	26	68	109	42	150	211	260
Whiterocks River nr Whiterocks	APR-JUL	20	32	39	70	47	58	56
DUCHESNE R nr Randlett	APR-JUL	33	65	120	37	218	358	325

UINTAH BASIN & DAGGET SCD'S
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
FLAMING GORGE	3749.0	2631.0	2629.0	2920.0
MOON LAKE	49.5	17.8	21.8	30.8
RED FLEET	25.7	14.7	12.2	18.8
STEINAKER	33.4	14.3	10.0	24.2
STARVATION	165.3	154.7	148.8	138.6
STRAWBERRY-ENLARGED	1105.9	777.4	812.6	648.8

UINTAH BASIN & DAGGET SCD'S
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
UPPER GREEN RIVER in UTAH	6	62	55
ASHLEY CREEK	2	65	58
BLACK'S FORK RIVER	2	76	63
SHEEP CREEK	1	39	35
DUCHESNE RIVER	11	102	69
LAKE FORK-YELLOWSTONE CRE	4	120	82
STRAWBERRY RIVER	4	86	51
UINTAH-WHITEROCKS RIVERS	2	103	80
UINTAH BASIN & DAGGET SCD	17	88	65

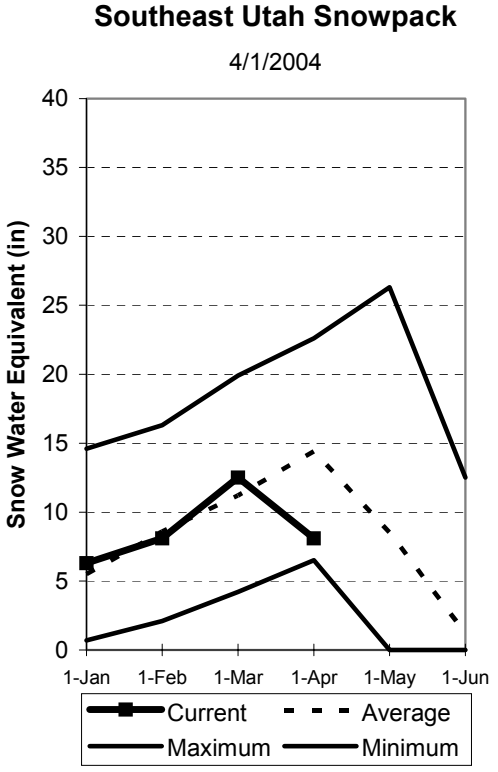
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

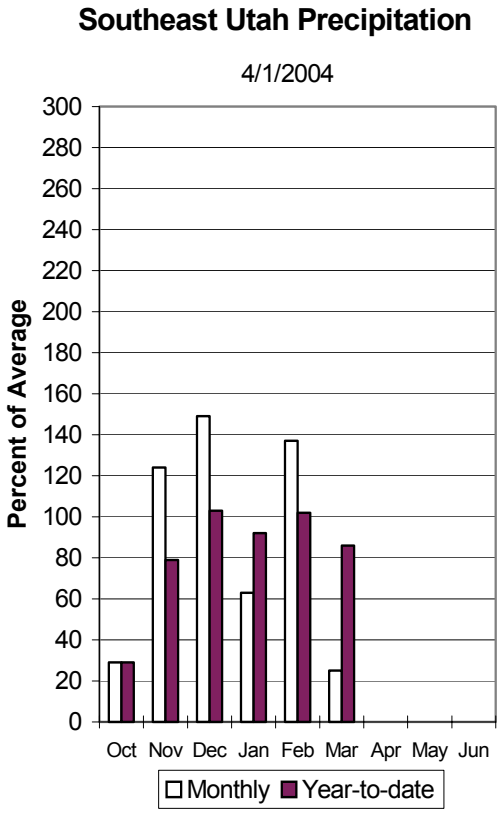
The average is computed for the 1971-2000 base period.

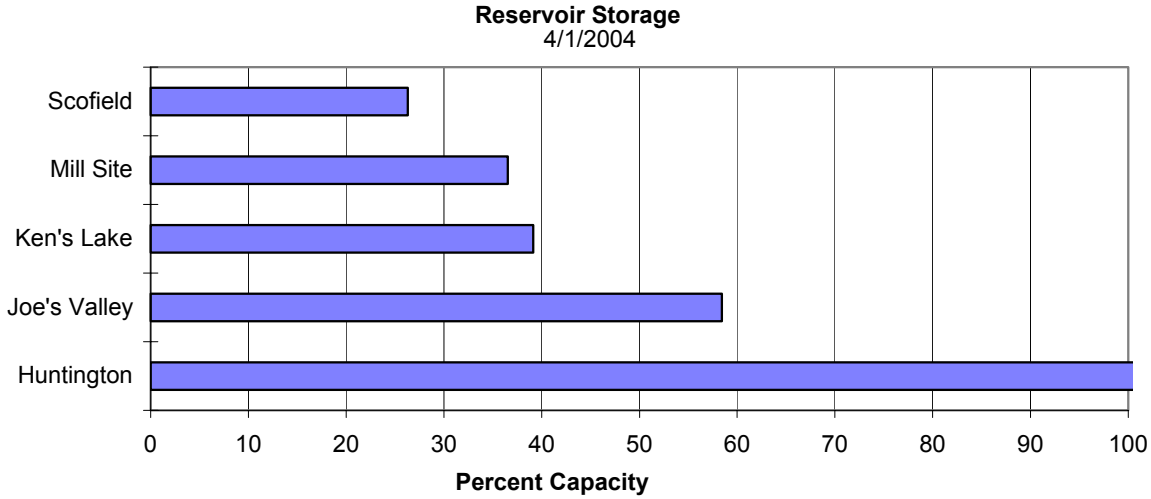
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Carbon, Emery, Wayne, Grand and San Juan Co.
Apr 1, 2004

Snowpacks in this region are much below normal at 56% of average, about 73% of last year, down 48% relative to last month. Individual sites range from 0% to 82% of average. Precipitation during March was much below average at 25%, bringing the seasonal accumulation (Oct-Mar) to 86% of normal. Soil moisture levels in runoff producing areas indicate about 3.5 inches of deficit in the upper 2 feet of soil. Forecast streamflows range from 36% to 60% of average. Reservoir storage is at 43% of capacity, up 5% from last year. Surface Water Supply Indeces for the area are: Price 11%, (much below normal) San Rafael area 24% (below average) and Moab 4% (much below average). General runoff and water supply conditions are much below to below normal.







CARBON, EMERY, WAYNE, GRAND, & SAN JUAN Co.
Streamflow Forecasts - April 1, 2004

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Gooseberry Creek nr Scofield	APR-JUL	3.2	4.9	6.0	50	7.1	8.8	11.9
Scofield Reservoir inflow	APR-JUL	14.2	18.9	22	48	25	30	46
White River blw Tabbyune Creek	APR-JUL	3.8	6.0	7.8	45	9.8	13.2	17.4
Green River at Green River, UT	APR-JUL	695	1310	1730	55	2150	2760	3170
Electric Lake inflow	APR-JUL	4.8	6.3	7.5	48	8.8	11.0	15.7
HUNTINGTON CK nr Huntington	APR-JUL	17.3	23	26	52	30	35	50
JOE'S VALLEY RESV Inflow	APR-JUL	17.7	28	35	60	42	52	58
Ferron Creek nr Ferron	APR-JUL	14.7	18.3	21	54	24	28	39
Colorado River nr Cisco	APR-JUL	1260	2030	2550	55	3070	3840	4650
Mill Creek at Sheley Tunnel nr Moab	APR-JUL	1.25	1.50	1.75	35	2.80	4.30	5.00
Seven Mile Creek nr Fish Lake	APR-JUL	1.05	2.10	3.60	51	5.10	7.30	7.00
Muddy Creek nr Emery	APR-JUL	5.5	9.4	12.0	60	14.6	18.5	19.9
North Ck ab R.S. nr Monticello	MAR-JUL	0.10	0.19	0.35	36	0.85	1.98	0.97
South Ck ab Lloyd's Res nr Monticell	MAR-JUL	0.14	0.27	0.57	42	0.85	1.36	1.37
Recapture Ck bl Johnson Ck nr Blandi	MAR-JUL	0.50	1.01	2.00	40	3.53	5.63	5.05
San Juan River nr Bluff	APR-JUL	485	700	850	69	995	1215	1230

CARBON, EMERY, WAYNE, GRAND, & SAN JUAN Co.
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
HUNTINGTON NORTH	4.2	4.0	4.2	3.9
JOE'S VALLEY	61.6	35.1	24.4	41.4
KEN'S LAKE	2.3	0.9	0.9	1.4
MILL SITE	16.7	6.1	8.7	86.2
SCOFIELD	65.8	17.3	19.3	34.7

CARBON, EMERY, WAYNE, GRAND, & SAN JUAN Co.
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
PRICE RIVER	3	63	48
SAN RAFAEL RIVER	3	88	65
MUDDY CREEK	1	82	61
FREMONT RIVER	3	80	68
LASAL MOUNTAINS	1	42	33
BLUE MOUNTAINS	1	65	57
WILLOW CREEK	1	57	36
CARBON, EMERY, WAYNE, GRA	13	73	56

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

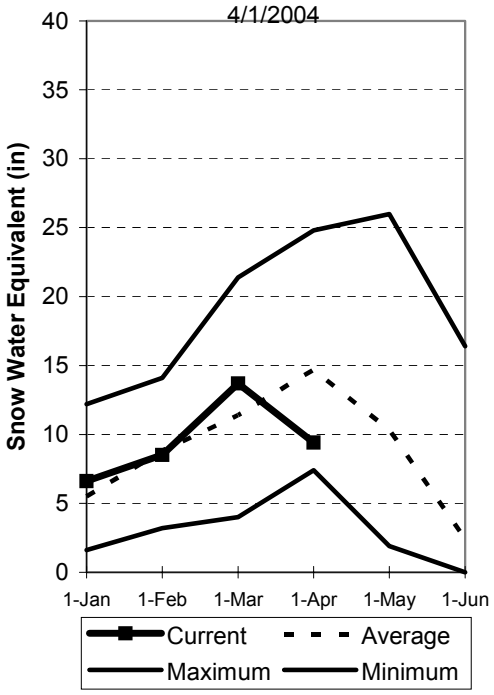
The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

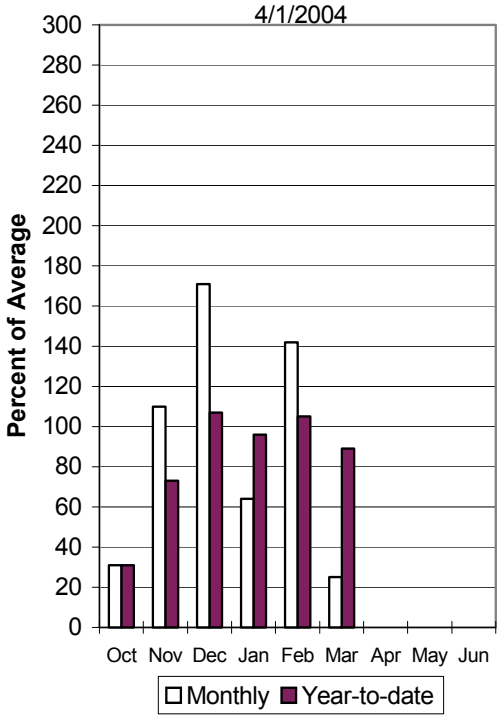
Sevier and Beaver River Basins
Apr 1, 2004

Snowpacks on the Sevier River Basin are above normal at 64% of average, about 182% of last year, down 48% relative to last month. Individual sites range from 0% to 90% of average. Low elevation snowpacks are gone. Precipitation during March was much below average at 25% of normal, bringing the seasonal accumulation (Oct-Mar) to 89% of average. Soil moisture levels in runoff producing areas indicate about 5 inches (Sevier) and 8.5 inches (Beaver) of deficit in the upper 2 feet of soil. Streamflow forecasts range from 16% to 63% of average. Reservoir storage is at 31% of capacity, 3% less than last year. Surface Water Supply Indeces are: Upper Sevier 27%, Lower Sevier 15% and Beaver 11%. Water supply conditions remain much below normal due to low snowpack, reservoir storage and soil moisture.

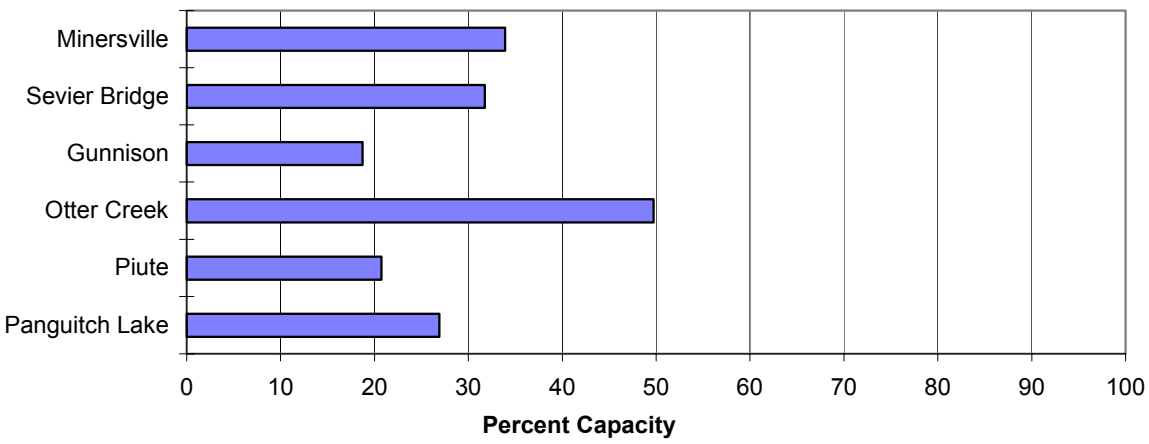
Sevier River Snowpack



Sevier River Precipitation



Reservoir Storage
4/1/2004



SEVIER & BEAVER RIVER BASINS
Streamflow Forecasts - April 1, 2004

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Sevier River at Hatch	APR-JUL	4.9	16.6	23	42	29	41	55
Sevier River nr Kingston	APR-JUL	9.8	32	38	43	44	66	89
EF Sevier R nr Kingston	APR-JUL	3.8	16.2	24	63	32	44	38
Sevier R blw Piute Dam	APR-JUL	14.0	46	67	53	88	120	126
Clear Creek nr Sevier	APR-JUL	4.2	5.6	9.0	41	12.4	19.1	22
Salina Creek at Salina	APR-JUL			MUCH BELOW AVERAGE				19.7
Sevier R nr Gunnison	APR-JUL	50	46	120	43	194	325	280
Chicken Creek nr Levan	APR-JUL	0.65	1.09	1.49	33	1.97	2.86	4.50
Oak Creek nr Oak City	APR-JUL	0.42	0.63	0.80	48	0.99	1.31	1.66
Beaver River nr Beaver	APR-JUL	9.7	12.1	14.0	52	16.0	19.4	27
Minersville Reservoir inflow	APR-JUL	0.2	1.1	2.6	16	4.7	8.9	16.6

SEVIER & BEAVER RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
GUNNISON	20.3	3.8	3.6	16.3
MINERSVILLE (RkyFd)	23.3	7.9	6.8	17.9
OTTER CREEK	52.5	26.1	32.4	43.5
PIUTE	71.8	14.9	2.5	58.5
SEVIER BRIDGE	236.0	74.9	93.5	189.7
PANGUITCH LAKE	22.3	6.0	4.0	152.9

SEVIER & BEAVER RIVER BASINS
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as % of Last Yr	Average
UPPER SEVIER RIVER (south	8	100	67
EAST FORK SEVIER RIVER	3	99	72
SOUTH FORK SEVIER RIVER	5	101	64
LOWER SEVIER RIVER (inclu	6	63	56
BEAVER RIVER	2	103	82
SEVIER & BEAVER RIVER BAS	16	83	64

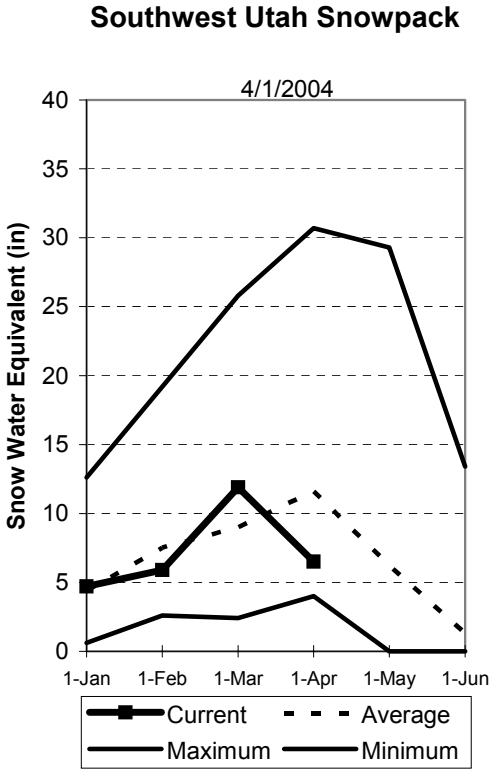
* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

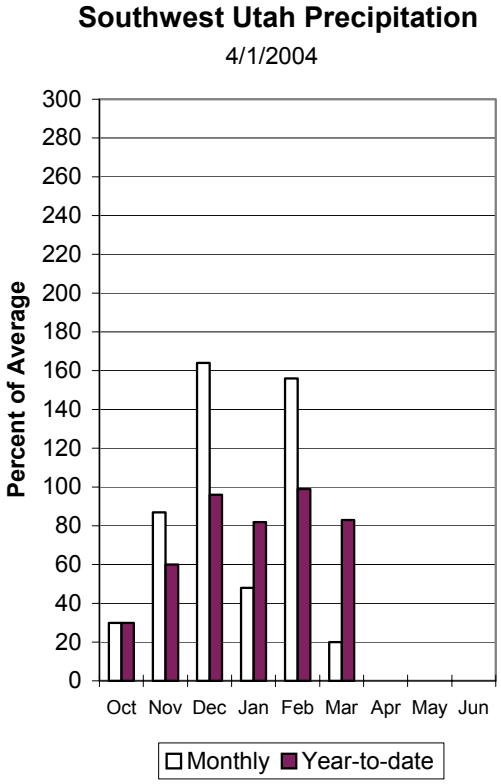
The average is computed for the 1971-2000 base period.

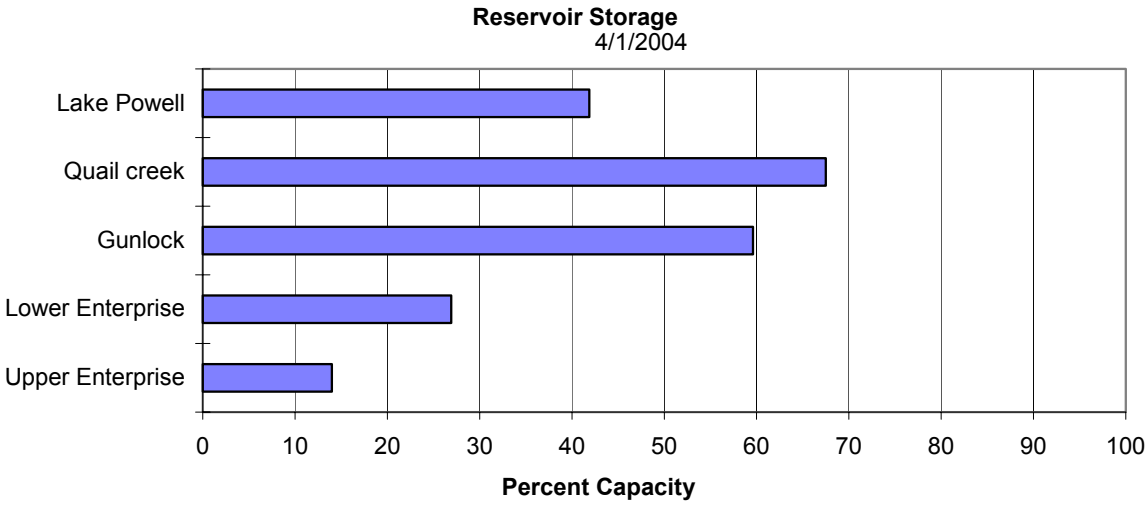
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

E. Garfield, Kane, Washington, & Iron co.
Apr 1, 2004

Snowpacks in this region are much below normal at 56% of average, about 103% of last year, down 59% relative to last month. Individual sites range from 0% to 89% of average. Precipitation was much below normal during March at 20% of average, bringing the seasonal accumulation (Oct-Mar) to 83% of normal. Soil moisture levels in runoff producing areas indicate about 4.8 inches of deficit in the upper 2 feet of soil. Forecast streamflows range from 31% to 44% of average. Reservoir storage is at 56% of capacity, 20% more than last year. The Surface Water Supply Index is at 24%, indicating much below normal water availability. Concerns remain over low reservoir storage, soil moisture and low snowpacks.







E. GARFIELD, KANE, WASHINGTON, & IRON Co.
Streamflow Forecasts - April 1, 2004

Forecast Point	Forecast Period	90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	50% (Most Probable) (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
		<<====== Drier ======		Future Conditions		======= Wetter =====>>		
		========== Chance Of Exceeding * ==========						
Lake Powell inflow	APR-JUL	1490	2980	4000	50	5020	6510	7930
Virgin River nr Virgin	APR-JUL	14.7	22	28	44	35	46	64
Virgin River nr Hurricane	APR-JUL	5.8	16.0	23	33	30	40	69
Santa Clara River nr Pine Valley	APR-JUL	0.82	1.51	2.10	38	2.79	3.97	5.50
Coal Creek nr Cedar City	APR-JUL	7.1	8.8	10.0	52	11.3	13.4	19.3

E. GARFIELD, KANE, WASHINGTON, & IRON Co.
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
GUNLOCK	10.4	6.2	5.8	4.5
LAKE POWELL	24322.0	10186.0	12458.0	---
QUAIL CREEK	40.0	27.0	15.6	31.0
UPPER ENTERPRISE	10.0	1.4	0.3	---
LOWER ENTERPRISE	2.6	0.7	0.7	137.1

E. GARFIELD, KANE, WASHINGTON, & IRON Co.
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
VIRGIN RIVER	5	111	57
PAROWAN	2	123	82
ENTERPRISE TO NEW HARMONY	2	0	0
COAL CREEK	2	112	68
ESCALANTE RIVER	2	89	74
E. GARFIELD, KANE, WASHIN	9	102	56

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1971-2000 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

UTAH SURFACE WATER SUPPLY INDEX Snow Surveys NRCS USDA Basin or Region SWSI/% Percentile Years with Similar SWSI 1-Mar-04			
Bear River	-3.98	2%	2003,93,92,91
Ogden River	-2.1	25%	90,02,00,91
Weber River	-2.4	21%	90,01,91,87
Provo	-2.8	17%	56,03,55,59
West Uintah Basin	1.1	64%	87,02,96,86
East Uintah Basin	0	50%	91,01,97,85
Price River	-1.9	28%	03,89,98,62
San Rafael	0.1	52%	2000,87,74,82
Moab	-.5	44%	82,97,00,96
Upper Sevier River	-1.1	37%	00,67,99,66
Lower Sevier River	-1.3	35%	72,78,90,01
Beaver River	-1.5	32%	91,92,2001,65
Virgin River	0.2	54%	86.94,01,97

Snow Surveys

245 N Jimmy Doolittle Rd
Salt Lake City, UT
(801) 524-5213

SWSI Scale: -4 to 4
Percentile: 0 - 100%

What is a Surface Water Supply Index?

The Surface Water Supply Index (SWSI) is a predictive indicator of total surface water availability within a watershed for the spring and summer water use seasons. The index is calculated by combining pre-runoff reservoir storage (carryover) with forecasts of spring and summer streamflow which are based on current snowpack and other hydrologic variables. SWSI values are scaled from +4.1 (abundant supply) to -4.1 (extremely dry) with a value of zero (0) indicating media water supply as compared to historical analysis. SWSI's are calculated in this fashion to be consistent with other hydroclimatic indicators such as the Palmer Drought Index and the Precipitation index.

Utah Snow Surveys has also chosen to display the SWSI as a PERCENT CHANCE OF NON-EXCEEDANCE. While this is a very cumbersome name, it has the simplest application. It can be best thought of as a simple scale of 1 to 99 with 1 being the drought of record (driest possible conditions) and 99 being the flood of record (wettest possible conditions) and a value of 50 representing average conditions. This rating scale is a percentile rating as well, for example a SWSI of 75% means that this years water supply is greater than 75% of all historical events and that only 25% of the time has it been exceeded. Conversely a SWSI of 10% means that 90% of historical events have been greater than this one and that only 10% have had less total water supply. This scale is far more intuitive for most people and is totally comparable between basins: a SWSI of 50% means the same relative ranking on watershed A as it does on watershed B, which may not be strictly true of the +4 to -4 scale.

For more information on the SWSI go to: www.ut.nrcs.usda.gov/snow/ on the water supply page. The entire period of historical record for reservoir storage and streamflow is available.

DATA CURRENT AS OF:04/05/04 06:46:17

S N O W C O U R S E D A T A

APRIL 2004

SNOW COURSE	ELEV.	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 71-00
AGUA CANYON SNOTEL	8900	4/01	8	2.2	2.5	7.1
ALTA CENTRAL	8800	3/30	76	34.0	27.2	37.3
BEAVER DAMS SNOTEL	8000	4/01	-	0.3	7.5	10.5
BEAVER DIVIDE SNOTEL	8280	4/01	2	0.4	5.6	10.6
BEN LOMOND PK SNOTEL	8000	4/01	69	33.2	23.2	41.5
BEN LOMOND TR SNOTEL	6000	4/01	46	18.9	8.2	19.5
BEVAN'S CABIN	6450	3/30	32	12.7	7.4	11.6
BIG FLAT SNOTEL	10290	4/01	49	14.5	14.7	19.0
BIRCH CROSSING	8100	3/29	3	1.1	3.6	5.4
BLACK FLAT-U.M. CK S	9400	4/01	14	5.6	8.7	10.3
BLACK'S FORK GS-EF	9340	3/29	17	7.0	10.0	9.7
BLACK'S FORK JUNCTN	8930	3/29	16	6.4	8.3	9.3
BOX CREEK SNOTEL	9800	4/01	28	11.0	12.2	13.7
BRIAN HEAD	10000	3/28	38	15.9	15.7	21.1
BRIGHTON SNOTEL	8750	4/01	44	15.4	17.7	25.4
BRIGHTON CABIN	8700	3/31	48	20.3	19.7	27.8
BROWN DUCK SNOTEL	10600	4/01	50	16.7	13.0	18.2
BRYCE CANYON	8000	4/01	0	0.0	0.0	3.8
BUCK FLAT SNOTEL	9800	4/01	32	11.2	13.9	18.7
BUCK PASTURE	9700	3/29	37	10.4	14.3	16.9
BUCKBOARD FLAT	9000	3/30	27	9.0	10.0	12.4
BUG LAKE SNOTEL	7950	4/01	36	13.5	16.0	21.2
BURT'S-MILLER RANCH	7900	3/29	0	0.0	5.0	4.9
CAMP JACKSON SNOTEL	8600	4/01	17	7.7	11.9	13.6
CASCADE MOUNTAIN SNO	7770	4/01	37	13.7	10.7	-
CASTLE VALLEY SNOTEL	9580	4/01	29	10.1	9.5	14.6
CHALK CK #1 SNOTEL	9100	4/01	42	16.1	18.7	24.9
CHALK CK #2 SNOTEL	8200	4/01	34	11.3	15.1	16.2
CHALK CREEK #3	7500	3/29	4	1.0	5.7	6.9
CHEPETA SNOTEL	10300	4/01	-	10.3	10.2	14.2
CLAYTON SPRINGS SNTL	10000	4/01	21	9.2	9.8	-
CLEAR CK RIDG #1 SNT	9200	4/01	26	11.5	16.9	19.7
CLEAR CK RIDG #2 SNT	8000	4/01	25	9.5	12.5	14.7
CORRAL	8200	3/28	12	4.2	7.3	9.0
CURRANT CREEK SNOTEL	8000	4/01	9	3.3	3.0	10.2
DANIELS-STRAWBERRY S	8000	4/01	24	9.8	10.3	16.7
DILL'S CAMP SNOTEL	9200	4/01	26	9.1	11.1	14.9
DONKEY RESERVOIR SNO	9800	4/01	17	5.0	9.3	8.7
DRY BREAD POND SNTL	8350	4/01	30	16.4	10.9	22.6
DRY FORK SNOTEL	7160	4/01	-	14.4	9.5	18.2
EAST WILLOW CREEK SN	8250	4/01	13	3.0	5.3	8.3
FARMINGTON U. SNOTEL	8000	4/01	82	40.9	23.2	34.3
FARMINGTON LOWER SC	6950	3/30	72	29.8	14.9	25.6
FARMINGTON L. SNOTEL	6780	4/01	56	22.2	-	-
FARNSWORTH LK SNOTEL	9600	4/01	51	17.3	20.5	19.6
FISH LAKE	8700	3/28	15	5.3	7.4	8.8
FIVE POINTS LAKE SNO	10920	4/01	40	15.6	11.8	17.7
G.B.R.C. HEADQUARTER	8700	3/28	30	11.3	15.2	16.6
G.B.R.C. MEADOWS	10000	3/28	52	20.5	19.4	24.0
GARDEN CITY SUMMIT	7600	3/29	41	15.7	13.7	16.2
GEORGE CREEK	8840	3/27	62	26.8	16.8	22.3
GOOSEBERRY R.S.	8400	3/28	18	6.8	14.8	12.0
GOOSEBERRY R.S. SNTL	7900	4/01	0	0.0	12.1	8.7
HARDSCRABBLE SNOTEL	7250	4/01	-	13.2	9.7	20.2
HARRIS FLAT SNOTEL	7700	4/01	1	0.2	0.3	6.7
HAYDEN FORK SNOTEL	9100	4/01	15	4.9	14.2	16.6
HENRY'S FORK	10000	3/29	19	5.2	10.6	14.0
HEWINTA SNOTEL	9500	4/01	13	5.8	10.3	12.1
HICKERSON PARK SNTL	9100	4/01	10	2.7	6.9	7.7
HIDDEN SPRINGS	5500	3/30	1	0.3	0.0	2.4
HOBBLE CREEK SUMMIT	7420	3/28	25	10.5	7.6	13.9
HOLE-IN-ROCK SNOTEL	9150	4/01	8	2.7	7.7	7.2
HORSE RIDGE SNOTEL	8260	4/01	34	14.3	15.7	23.9
HUNTINGTON-HORSESHOE	9800	3/28	46	17.5	17.5	24.0
INDIAN CANYON SNOTEL	9100	4/01	16	5.6	10.2	11.9
JOHNSON VALLEY	8850	3/28	8	2.6	7.4	7.1
JONES CORRAL G.S.	9720	3/28	32	9.1	11.1	12.5
KILFOIL CREEK	7300	3/29	39	14.9	9.9	14.4

SNOW COURSE	ELEV.	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 71-00
KILLYON CANYON	6300	3/30	3	1.3	0.0	5.6
KIMBERLY MINE SNOTEL	9300	4/01	26	10.0	15.4	16.7
KING'S CABIN SNOTEL	8730	4/01	11	5.7	11.6	11.3
KLONDIKE NARROWS	7400	3/29	29	12.5	12.9	19.2
KOLOB SNOTEL	9250	4/01	39	14.4	13.3	23.9
LAKEFORK #1 SNOTEL	10100	4/01	32	10.6	9.6	12.7
LAKEFORK BASIN SNTL	10900	4/01	51	13.9	12.8	20.7
LAKEFORK MOUNTAIN #3	8400	3/29	6	2.4	5.0	6.0
LAMBS CANYON	7400	3/31	29	11.7	9.6	16.1
LASAL MOUNTAIN LOWER	8800	3/29	10	4.0	9.2	9.8
LASAL MOUNTAIN SNTL	9850	4/01	11	4.4	10.5	13.5
LILY LAKE SNOTEL	9050	4/01	18	7.0	12.0	13.5
LITTLE BEAR LOWER	6000	3/29	26	11.1	2.7	9.5
LITTLE BEAR SNOTEL	6550	4/01	-	2.8	0.0	12.3
LITTLE GRASSY SNOTEL	6100	4/01	-	0.0	0.0	.7
LONG FLAT SNOTEL	8000	4/01	-	0.0	0.0	7.5
LONG VALLEY JCT. SNT	7500	4/01	-	0.0	0.0	3.2
LOOKOUT PEAK SNOTEL	8200	4/01	-	28.2	20.3	24.3
LOST CREEK RESERVOIR	6130	3/29	0	0.0	.3	2.0
LOUIS MEADOW SNOTEL	6700	4/01	24	12.5	8.1	-
MAMMOTH-COTTONWD SNT	8800	4/01	20	9.5	15.1	21.0
MERCHANT VALLEY SNTL	8750	4/01	30	12.1	11.1	13.4
MIDDLE CANYON	7000	3/30	33	13.8	8.9	14.0
MIDWAY VALLEY SNOTEL	9800	4/01	53	22.5	17.1	25.3
MILL CREEK	6950	3/31	51	19.5	12.2	20.6
MILL-D NORTH SNOTEL	8960	4/01	-	18.0	15.6	25.5
MILL-D SOUTH FORK	7400	3/31	31	13.5	10.1	19.1
MINING FORK SNOTEL	8000	4/01	42	19.7	13.1	21.0
MONTE CRISTO SNOTEL	8960	4/01	51	21.3	15.5	30.1
MOSBY MTN. SNOTEL	9500	4/01	26	10.8	10.2	12.1
MT.BALDY R.S.	9500	3/28	51	19.3	20.3	24.1
MUD CREEK #2	8600	3/28	31	11.1	11.1	13.5
OAK CREEK	7760	3/28	32	10.3	10.5	12.0
PANGUITCH LAKE R.S.	8200	3/28	8	2.9	1.1	4.0
PARLEY'S CANYON SNTL	7500	4/01	24	7.1	8.9	17.1
PARRISH CREEK SNOTEL	7740	4/01	62	27.7	16.5	-
PAYSON R.S. SNOTEL	8050	4/01	31	11.8	12.4	20.6
PICKLE KEG SNOTEL	9600	4/01	29	11.7	15.2	17.9
PINE CREEK SNOTEL	8800	4/01	-	18.1	20.2	24.8
RED PINE RIDGE SNTL	9200	4/01	26	10.2	13.2	17.3
REDDEN MINE LOWER	8500	3/29	29	11.0	12.0	17.8
REES'S FLAT	7300	3/28	28	9.9	10.5	12.6
ROCK CREEK SNOTEL	7900	4/01	-	3.6	6.9	8.1
ROCKY BN-SETTLEMT SN	8900	4/01	47	22.8	16.9	26.5
SEELEY CREEK SNOTEL	10000	4/01	28	11.7	10.6	15.3
SMITH MOREHOUSE SNTL	7600	4/01	17	6.4	9.0	14.0
SNOWBIRD SNOTEL	9700	4/01	93	42.5	25.9	35.8
SPIRIT LAKE	10300	3/29	27	10.5	11.2	13.8
SQUAW SPRINGS	9300	3/28	13	4.6	7.3	7.1
STEEL CREEK PARK SNO	10100	4/01	38	11.8	12.8	15.9
STILLWATER CAMP	8550	3/29	12	4.6	9.5	10.5
STRAWBERRY DIVIDE SN	8400	4/01	28	10.5	10.3	18.7
SUSC RANCH	8200	3/28	4	2.1	0.9	7.0
TALL POLES	8800	3/28	29	13.0	11.5	14.7
TEMPLE FORK SNOTEL	7410	4/01	29	10.7	14.1	-
THAYNES CANYON SNTL	9200	4/01	45	17.5	17.2	24.9
THISTLE FLAT	8500	3/28	32	12.3	17.0	16.9
TIMBERLINE	9100	3/28	25	9.6	11.5	14.7
TIMPANOGOS DIVIDE SN	8140	4/01	41	16.7	10.7	24.0
TONY GROVE LK SNOTEL	8400	4/01	55	27.8	33.1	37.7
TONY GROVE R.S.	6250	3/29	16	5.9	6.0	11.1
TRIAL LAKE	9960	3/29	45	18.6	16.9	24.2
TRIAL LAKE SNOTEL	9960	4/01	39	15.8	13.9	25.3
TROUT CREEK SNOTEL	9400	4/01	18	7.4	8.7	11.2
UPPER JOES VALLEY	8900	3/28	15	5.7	9.0	9.9
VERNON CREEK SNOTEL	7500	4/01	27	9.5	4.4	11.7
VIPONT	7670	3/27	39	16.6	2.8	15.4
WEBSTER FLAT SNOTEL	9200	4/01	16	5.6	7.9	15.9
WHITE RIVER #1 SNTL	8550	4/01	13	4.9	8.9	13.5
WHITE RIVER #3	7400	3/28	0	.0	4.5	6.1
WIDTSOE #3 SNOTEL	9500	4/01	30	10.9	9.0	12.8
WRIGLEY CREEK	9000	3/28	23	8.5	9.6	11.3
YANKEE RESERVOIR	8700	3/30	16	6.1	8.4	10.0

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Utah Water Supply Outlook Report

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